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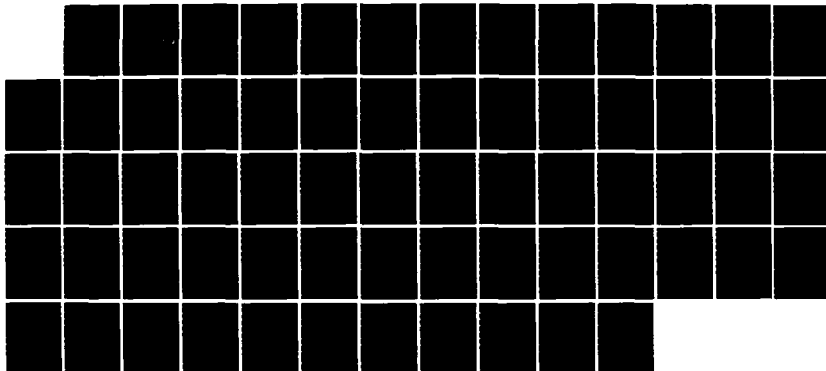
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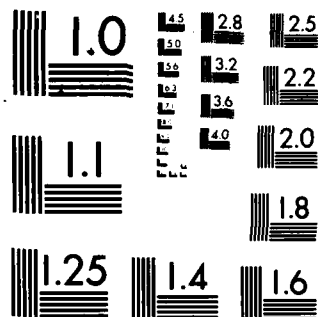
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FIELD ARTILLERY AND THE
OPERATIONAL OFFENSIVE

by

Michael T. Chychota, MAJ, USA

School of Advanced Military Studies
U.S. Army Command and General Staff College

Fort Leavenworth, Kansas

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The study concludes that the most important difference is that the concept of planning to sequence artillery unit movements and actions well beyond the seizure of the initial objectives, deep into the enemy's rear areas is well established in Russian doctrine, but not in American doctrine. Current American artillery doctrinal literature is inadequate. The procedures and principles of World War II provide a sound basis for updating current doctrine.

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Approved By:

Dale E. Fincke, Monograph Director
LTC Dale E. Fincke, M.S.

Richard H. Sinnreich, Director, School of
COL Richard H. Sinnreich, M.A. Advanced Military Studies

Philip J. Brookes, Director, Graduate Degree
Philip J. Brookes, Ph.D. Programs

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ABSTRACT

FIELD ARTILLERY AND THE OPERATIONAL OFFENSIVE, by Major
Michael T. Chychota, USA, 57 pages.

This study is a historical analysis of the demonstrated Russian and American artillery principles and techniques which were instrumental in achieving success in offensive actions at the operational level of war during World War II. Each army's concept is examined based on historical records and contemporary literature and then compared to reveal similarities and differences. The common characteristics are then compared to the general considerations listed in the 1986 version of FM 100-5 Operations. The Russian Vistula-Oder Operation and the American Operation Cobra illustrate the similarities and differences.

The conclusions which could be drawn are that 1) artillery support for actions at the tactical level of war and the operational level of war are very similar, 2) operational fire or operational field artillery is more correctly a procedure to support actions at the operational level of war, and 3) both the Russian and American artillery doctrines of World War II effectively supported their respective maneuver doctrines. Each country's doctrine achieved the goals set by the country's army and were based on different concepts, yet were still very similar.

The study concludes that the most important difference is the concept of planning to sequence artillery movements and actions well beyond the seizure of the initial objectives, deep into the enemy's rear areas. The Russians fully grasp the importance of the concept. The Americans are beginning to grasp the concept, but current American artillery doctrinal literature is inadequate. The procedures and principles of World War II provide a sound basis for updating current doctrine.

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INTRODUCTION

Some armies, like the Russian Army, have appreciated the importance of the operational level of war for many years and have studied and developed the concept in great detail. Other armies, like the American Army, are just now officially recognizing the significance of the operational level of war. As a result, as the Americans incorporate the operational level of war into their current doctrine, controversies develop. Not only are the maneuver arms embroiled in the controversies about the doctrine; so are the combat support arms, because the creation of their support doctrine must wait until they know what they are to support.

If there is a need for an artillery doctrine especially tailored for the operational level of war, then the American artillery community has a problem. There is no current adequate doctrine. Operational level field artillery is not defined anywhere in American works and the concept itself is questionable. Perhaps a look at the past would provide a starting point for the development of adequate doctrine.

In his book, On War, Carl Von Clausewitz wrote that "historical examples clarify everything and also provide the best kind of proof in the empirical sciences. This is particularly true of the art of war."¹ Therefore, historical examples of operational field artillery employment should clarify the concept. However, looking for examples of operational field artillery support is an exercise in frustration. Think for a few moments of all the historical examples that come to mind and see if there is just one in which the battle or campaign was won by the application of field artillery alone. The

closest examples that come to mind are the carpet bombing of Normandy during World War II, a tactical application of strategic bombing, and the air interdiction program against North Korea during the Korean Conflict. Even Napoleon's classic use of field artillery at the battle of Wagram was simply the very effective use of artillery to allow his corps to maneuver. Artillery did not decide the battle. Artillery supported the maneuver. There is not really any known example of operational field artillery support. Instead, our challenge is to understand field artillery support of actions at the operational level of war.

Again, thinking of well known historical examples of large operations in which artillery played a major role brings to mind Panzer Divisions on the sands of North Africa and pictures of T-34's crunching across the frozen steppes of the Ukraine. World War II provides the most widely known examples of the operational level of war.

Given that World War II provides the most commonly known examples, which armies of that conflict would provide the most meaningful examples? The continuing confrontation between NATO and the Warsaw Pact today suggests that the critical arena of future conventional combat remains Central Europe and the two most powerful combatants are the Russians and the Americans. Therefore, a historical analysis of the Russian and American field artillery support of actions at the operational level of war during World War II should be most relevant today.

Since FM 100-5 Operations describes the future combat of AirLand Battle as a swirling maelstrom of battle, the significance of

the fast moving exploitations of World War II is readily apparent.² Granted, the pace of combat has increased since World War II, as have the frontages of the units and the lethality and destructiveness of the weapon systems. In spite of the changes, many of the principles and concepts manifested in World War II may remain valid today. The procedures and principles that worked for the Russians and Americans in World War II will probably work today in very similar conditions. The experiences of World War II may therefore serve as a basis for developing field artillery doctrine appropriate to the operational as well as the tactical levels of war.

The central question is whether the characteristics and considerations of planning and executing field artillery support for a sequence of battles or a campaign are different from those for an engagement or single battle.

Since there is no existing American doctrinal definition of artillery support of actions at the operational level of war, is there a difference between artillery support of tactical actions and artillery support of operational actions? If so, does the difference matter? The historical experience suggests that there is indeed an important difference between the artillery employment at the tactical and the operational levels of war and that an American doctrinal void therefore exists.

This study will examine field artillery support of actions at the operational level of war versus the support of actions at the tactical level of war. The Russian Vistula-Oder Campaign and the American Operation Cobra will illustrate the concepts. Although operational actions can be offensive and defensive in nature, only the two offensive operations will be examined.

THE OPERATIONAL LEVEL OF WAR

FM 100-5 Operations defines three levels of war. The tactical level of war is the foundation of the construct and is the translation of combat power into victorious engagements and battles. The strategic level of war is the super-structure of the construct and is the establishment of goals in theaters of operations and the assignment of forces to achieve those goals. The operational level of war is the framework of the construct and is the employment of military forces in a theater of operations in campaigns or major operations designed to achieve strategic aims.³ The operational level of war is the connection between strategy and tactics and is concerned with the maneuver and support of large military units.

Campaigns and major operations characterize the operational level of war. Campaign plans set long term goals to be achieved through the completion of major operations.⁴ Operational planning centers on the massing of tactical formations and sequencing of actions to bring the enemy to battle under the best terms possible, while tactical planning centers on the preparation for battles of engagements.⁵ If the operational commander is concerned with the massing of units and the tactical commander is concerned with the preparation for battle, then logically, the supporting artillery commander should follow a similar line of reasoning. In fact, the actions of World War II indicate that at the operational level of war, artillery commanders massed units, while at the tactical level of war, they massed fires.

In the conduct of successful campaigns and operations, the principal task of theater and subordinate commanders is to concentrate superior strength against enemy vulnerabilities at the decisive time

and place.⁶ In order to do so, the operational commander must anticipate future conditions at the decisive time and place. The supporting artillery commander must follow a similar thought process. During World War II, the successful artillery commanders planned their actions so that the artillery provided continuous support, yet also provided the needed support at the decisive time and place in synchronization with the operational plan.

According to FM 100-5 Operations, the basic requirements for achieving success at both the tactical and the operational levels of war are identical. The requirements are agility, initiative, depth, and synchronization.⁷ If the tactical and operational commanders must meet these requirements to achieve success, then logically, the supporting artillery commanders must as well.

According to FM 6-20 Fire Support in Combined Arms Operations, there are five basic principles for planning the task organization and employment of field artillery. The five basic principles are 1) provide adequate support for committed units, 2) weight the critical sector or main effort, 3) facilitate future operations, 4) provide immediately available fire support with which the commander can influence the action, and 5) retain maximum feasible centralized control.⁸ These principles are so universal that they apply to all levels of war and cannot be used to distinguish between the support of tactical actions and the support of operational actions.

Since the five basic principles of organizing field artillery apply to all levels of war, just what differentiates the field artillery support of actions at the tactical level of war from the support of

actions at the operational level of war? Distinctions are made usually according to: 1) the size or amount of field artillery support, 2) the echelon providing the support, 3) the time duration of the support, 4) the location of the support, 5) the target of the support, and, most important, 6) the perspective of the commander employing the support.

SIZE - The amount of artillery support at the tactical level is normally much smaller than that at the operational level of war. The concept is almost self-evident. During the support of a battalion task force assault on a defensive position, the field artillery would not be expected to expend as many rounds as during the support of a corps attack. Unless the munitions expended were weapons of mass destruction, such as chemical or nuclear weapons, low expenditures of artillery ammunition would not be expected to produce results at the operational level of war. Operational level results should result from large expenditures of munitions. The enormous expenditures of ammunition during World War I preparations were incapable of achieving operational results yet the exploiting armies of World War II fired much less artillery and achieved comparatively greater results. The increased scale of the actions affects other aspects of the operation as well, such as logistics.

ECHELON - The echelon of the field artillery unit providing the support is normally higher at the operational level of war than at the tactical level of war. A battery is not going to provide operational level results unless the munition fired was a weapon of mass destruction or the target was exceptionally important to the enemy force and was destroyed. However, one can easily visualize how a

massed concentration of artillery fired to impact simultaneously on a counterattacking force can provide operational level results, such as the destruction of the enemy's mobile reserve, which allows the commitment of friendly exploitation units. Again, the breakpoint is not clear. A division artillery time on target could be an operational method and a corps time on target could be a tactical technique.

TIME DURATION - The duration of the artillery support is normally greater at the operational than at the tactical level of war. A corps artillery mass mission can greatly assist a division's maneuver. But, how much greater can the assistance be if the corps artillery reinforces the fires of that same division during the entire maneuver? Obviously, the second situation would be much more likely to achieve results at the operational level of war than would the single mission. The concept of sequencing the artillery missions over a period of time is extremely important. Artillery programs are prime examples of sequenced artillery employment designed to achieve a specific purpose. Without the sequencing of missions over time, the field artillery would probably not achieve results at the operational level of war.

LOCATION - Most current literature on the operational level of war equates deep operations with the operational level of war. Obviously, the destruction of the enemy's second echelon armies produces operational results if the armies are not yet committed, but would the results not be operational if the armies were in contact with friendly forces when destroyed?

TARGET - At the operational level of war, the target is normally larger and has more far reaching significance than at the

tactical level of war. The destruction of an antitank position is not going to have the significance of the destruction of a front's command post. But, where is the distinction between a tactical target and an operational target? If the same enemy command post were destroyed completely by accident, would the command post's destruction enable the friendly forces to achieve results at the operational level of war? Obviously, there is more involved than the simple destruction of an important target.

PERSPECTIVE - The purpose of attacking a target has a great deal to do with distinguishing whether the artillery support is tactical or operational. If the target destruction or neutralization affects more than the local enemy force for a considerable time period, the target is probably an operational target. If the purpose of attacking the target is to allow some sort of operational maneuver or to channel the enemy into a particular course of action or avenue of approach, the commander implementing the artillery support very probably sees the artillery support as operational in nature. If, however, the commander sees the artillery support as merely the destruction of a portion of the enemy's force which really does not assist in attaining some strategic goal, then the artillery support is seen as tactical. Using such an approach, if the commander is mistaken, is the operational level artillery support really tactical support? If there is a difference, does the difference really matter? To the gunner at the piece, the support is the same. His job is to send rounds downrange on the target. To the artillery battalion commander, all missions are tactical. However, to the division fire

support coordinator planning the support of a division counterattack, that same battalion's fire may be an integral part of an intricate operational level plan.

The six time and spatial dimensions commonly used to describe field artillery support are obviously not usable determinants of whether the artillery support is at the tactical or operational level of war. What then can be the determining factors?

THE PROCESS - The time and spatial dimensions of the field artillery support affect the process of planning, organizing, and employing artillery assets to support a given maneuver. The process is important, not the dimensions of the support.

The operational commander and his supporting artillery commander determine what military conditions must be produced in the theater of operations to achieve the strategic goal. Then, they determine what sequence of actions is most likely to produce those conditions. Lastly, they determine how their resources should be applied to accomplish best that sequence of actions. The key is that the artillery commander develops a sequence of actions in synchronization with the operational plan that supports the intermediate operations as well as the actions at the decisive point to achieve a strategic goal.

THE RUSSIAN EXPERIENCE

During the early stages of World War II, the Russian Army sustained huge losses. However, the Russians learned from their defeats. The Russian Army instituted the lessons learned into their doctrine and refined their concepts of operational art. By 1945, the Russians were ready to demonstrate mastery of the operational art.

The Russians still use the Vistula-Oder Operation today as a prime example of how to conduct an operation.

THE VISTULA-ODER OPERATION (See Maps I and II)

On 12 January 1945, the Russians crossed the River Vistula with a concentrated force of infantry and tanks supported by massive air and artillery attacks and smashed the German defenses set up by Army Group A under General Harpe. The Russians exerted constant pressure on the retreating Germans and denied them a chance to regroup and form a coherent defense.

Despite sustaining tremendous losses in men and material, the Russians pushed the Germans back and established bridgeheads on the River Oder, less than ninety kilometers from Berlin. The attacking Russians crossed a distance of over five hundred kilometers on a front of nearly one thousand kilometers in less than twenty one days with a force of over two million men. Clearly, the Russians demonstrated their mastery of mobile warfare on a massive scale.

THE RUSSIAN PLAN

On the strategic offensive, the Russians wanted to destroy the German Army and take Berlin. The destruction of Army Group A was the step leading to the final assault on Berlin. Josef Stalin approved a plan which had his forces making two powerful thrusts toward Poznan and Breslau, to split and encircle Army Group A, thus destroying the defending Germans.

Marshal Zhukov's 1st Belorussian Front was to attack and destroy the German forces in the Warsaw-Radom grouping, capture Lodz and Zychlin, and move deep to Poznan, or even the River Oder. Four armies

and two tank armies were to attack out of the Magnuszew bridgehead toward Poznan. Two armies and a tank corps were to attack out of the Pulawy bridgehead toward Lodz. One army was to attack Warsaw from the north in conjunction with the Polish Army from the south, after crossing the River Vistula.

Marshal Konev's 1st Ukrainian Front was to attack and destroy the German forces in the Kielce-Radom grouping, capture Piotrkow, Czestochowa, and Bochnia, and move deep to Breslau. Konev decided to have seven armies and two tank armies attack out of the Sandomierz bridgehead on the Radomsko-Breslau axis and one army to take Krakow in conjunction with one army from the 4th Ukrainian Front under General Petrov.

The initial operational objectives of the 1st Belorussian Front were at a depth of 150-180 kilometers into the German rear while the objectives of the 1st Ukrainian Front were at a depth of 120-150 kilometers.⁹ The field artillery support for the operation demonstrated that the Russians deliberately and carefully planned the support for the deep offensive operations in a highly centralized manner, which followed the same three phase artillery offensive that characterized all contemporary Russian artillery employment.

Russian employment of artillery at the operational level of war was very much similar to their employment of artillery at the tactical level of war. The same principles and procedures were followed. The only differences were that the Russian planners maneuvered fire units rather than actual fires, massed units rather than fires, and attacked targets for purposes beyond the simple

destruction or suppression of the target. The differences were significant because the Russians could then effectively sequence actions and set the terms of battle in the desired sectors.

RUSSIAN FIELD ARTILLERY EMPLOYMENT

The Russians developed their artillery doctrine so that the basic principles applied at the tactical and operational level of war equally well. The 1944 version of the Red Army Field Service Regulations, which were followed rigidly during the Vistula-Oder Operation, introduced the concept of the artillery offensive. Essentially, the artillery had the mission of providing "...continuous support of the infantry and tanks by the concentrated and effective fire of artillery and mortars throughout the offensive."¹⁰ The artillery offensive was the massed employment of field artillery in a concerted effort divided into "...three periods, the preparation for the attack, support of the attack, and the providing of security for the action of the infantry and tanks in the depths of the defenses of the enemy."¹¹ The artillery offensive provided a very neat categorization of missions and objectives for the field artillery and lent itself to the sequencing of actions. Periods one and two were primarily tactical while period three was primarily operational.

PERIOD ONE

During the first period of the artillery offensive, the Russians prepared their artillery units for action and fired the initial artillery preparation. During the Vistula-Oder Operation, the Russians wargamed the actions of the units well in advance and worked out details of artillery support in a very minute manner. According

to Marshal V. Chuikov, during the period 8-19 December 1944, the 1st Belorussian Front conducted exercises designed to coordinate the operational unit formations, artillery attack methods, and the sequence and methods of supporting the expected exploitations.¹²

The Russian commanders paid great attention to the artillery considerations. Almost all the direct support (infantry support) tanks and assault guns were attached to the first echelon for direct fire support.¹³ In all, there were 230-250 guns and mortars, and 80-110 tanks and assault guns firing in support of the breakthrough per kilometer of front in the breakthrough sectors.¹⁴ The physical massing of the firepower was to insure the destruction of the German defenses in the main tactical areas and to seal the flanks and the nose of the penetration from counterattacking German units.

Direct fire techniques provided the most effective artillery support during the initial penetration because the fire units could see the targets they attacked and communication and coordination with the supported unit were eased by the colocation of maneuver and artillery command posts. The Russians placed great store in the efficiency and effectiveness of direct fire artillery, hence their great reliance on assault guns. The simple fire control mechanisms linked with the uncomplicated and rapid coordination methods of direct fire artillery simply fit the Russian concept of a reliable and effective fire support weapon system.

In order to mass large numbers of artillery pieces and to control their fires in detail, the Russians formed artillery groups at almost every echelon above maneuver battalion. Regimental artillery groupings

were as large 9-10 battalions.¹⁵ However, the large artillery groupings proved to be very unwieldy in the rapid combat of the assault, so the Russians devised a method by which the artillery groups slowly dissolved as the assault progressed. During the preparation not all the available artillery attacked enemy positions. Some Russian artillery was silent during the preparation. This silent artillery was the artillery which would immediately accompany the assault and exploitation troops in the attack and would provide support when the units outranged the stationary artillery or when the units encountered particularly stubborn defenses.¹⁶

Preparations were of two basic types. The first, and relatively uncommon, type was the preparation which lasted an entire day or more. The Russians found through experience that the longer preparations gave the enemy more time to react and that there were always enemy troops who survived the preparation, regardless of its intensity or duration. The second, and more common, type of preparation was the preparation which lasted an hour or two. The Russians depended on the suppressive and demoralizing effect of a massive surprise preparation, which ended only when the assault troops reached the enemy positions, thus capitalizing on the enemy's initial confusion and inability to react quickly.

During the Vistula-Oder Operation, the artillery in the 1st Ukrainian Front opened fire on 12 January 1945 at 0445 with an intensive fifteen minute preparation, concentrating on the German communication facilities and the front line positions opposite the Sandomierz bridgehead. At 0500, the artillery stopped firing and the

initial assault units rushed forward. Only one platoon from each assault battalion actually attacked, the remainder waited. Each attacking Russian vehicle towed two or three dummy tanks or guns stretched out on a cable.¹⁷ Watching the mass of advancing enemy, the Germans waited to insure that the Russian main attack was in progress. The assault troops took the first German positions and then stopped. For three hours, the Germans waited. Finally, convinced that the Russians had implemented another of their limited objective attacks, the Germans began moving their reserves to counterattack and restore the line.

At 1000, the real artillery concentrations began with an average of 214 artillery pieces per kilometer of front firing for two hours on assembly areas, command and control facilities, lines of communication, and artillery positions throughout the depth of the German defenses. The moving Germans, elements of the XXIV Panzer Corps, were virtually destroyed. German troop control and communications were severely disrupted. The 4th Panzer Army command post was badly battered.

At 1150, before the artillery had completed the preparation, the real assault began with the 5th Guards Army and 60th Army on the left, the 52nd Army in the center, and the 13th Army and 3rd Guards Army on the right making the initial penetrations. The assault troops were in the German positions before the Germans could react and as the infantry held open the breaches, the 4th Tank Army drove through the 52nd Army and the 5th Guards Army sector toward Czestochowa. The artillery preparation and close coordination with the maneuver units had effectively eliminated any coherent German defense in the breakthrough sector.

PERIOD TWO

Period Two was the support of the attack and was designed to destroy enemy weapons positions, especially anti-tank defenses, and prevent the enemy from manning their defenses before being overwhelmed by the assault troops.¹⁸ Period Two began when the preparation ended and continued until the assault troops seized the tactical objectives. Normally one artillery battalion and one anti-tank battalion supported each assault battalion from positions near the line of departure. Such forward locations, which many times overlooked the enemy positions, insured responsiveness and range capability, but also attracted counterbattery fire.¹⁹ The supporting artillery attacked targets along the flanks of the assault and at the nose of the penetration, well beyond the objective, deep into the enemy's rear. Self-propelled guns supporting the attack occupied firing positions in front of the jump off positions of the assault troops to conduct direct fire on the enemy main line of resistance from the very beginning of the attack.²⁰

During the attack, the supporting artillery attempted to box in the area of the penetration and isolate the battle area with fires on the flanks and the nose of the penetration. Standing barriers of high explosive and smoke shells protected the flanks. Successive concentrations and rolling barrages protected the nose. The advancing troops closely followed the rolling barrage or attacked through a strip barrage to reduce the defender's reaction time. Time after time, the Russians appeared in the German positions during the shelling or immediately after the artillery shifted, so that the German defenders were overwhelmed in their shelters.²¹

Fire control methods were of three basic types. First, artillery attacked planned targets throughout the depths of the enemy's defenses according to a time schedule. The schedules coordinated the time of firing, the volume of fire, and the shell/fuze combination of each target attacked. Since the schedules were based on probable rates of advance, the schedules were not very flexible. However, Russians liked schedules because the schedules were centrally coordinated and controlled and reliable communications with the assault echelons were not necessary. Trained observers with good observation of the target area were not necessary either. Rolling barrages on the nose of the attack moved at the calculated rate of advance of the assault troops while successive concentrations shifted according to time. The obvious disadvantage of scheduled fires in support of an attack was that when the infantry or armor lagged behind the artillery at all, the assault echelons had no indirect artillery support as the scheduled barrages and concentrations rolled off into the enemy positions.

Second, artillery attacked targets and maintained suppressive fire until the assault echelons signalled that the fire was to be lifted and shifted. Assault echelons controlled standing barrages and concentrations in such a manner.

Third, artillery units attacked designated planned targets on the command of the assault troops. Such on call targets decreased the artillery response time because the artillerymen had already calculated all the data, prepared all the equipment and munitions, and coordinated the method of attack before the assault troops requested the artillery fire.

Indirect artillery fires on unplanned targets or targets of opportunity were relatively uncommon. The Russian penchant for total control, typical obscuration of the target area, lack of reliable communication equipment, and lack of trained observers usually severely limited indirect artillery attacks on targets of opportunity.

Instead, the Russians followed the German example and made extensive use of the assault gun or accompanying artillery which usually attacked targets of opportunity. However, when the situation warranted, the Russians massed the fires of many battalions to neutralize resistance in particularly stubborn enemy positions. During the Vistula-Oder Operation, the Germans fanatically defended a train station in Grabow. Russian artillery massed the fires of three artillery brigades, firing 1,150 shells in five minutes on the German position.²² German resistance in Grabow's train station ceased.

The Russians had learned through experience that some German defensive positions would survive the initial artillery preparations and concentrations. They therefore relied heavily on the assault guns and self-propelled artillery for close continuous direct fire support for the assault echelon. Under conditions of limited visibility, individual gun crews drove their weapons up to the enemy strongpoints and engaged them at point blank range.²³

Close coordination between the attacking forces and the artillery was extremely important. The artillery commander therefore located himself with the supported tank or infantry commander and fought his artillery much as the tank commander fought his tanks and the infantry commander fought his infantry.

Artillery commanders moving with the assault echelons used pre-arranged signals and codes to adjust their fire plans. Fire plans were often based upon vague data and oriented upon prominent terrain features.²⁴

The artillery which accompanied the tanks and infantry deep into the enemy defenses was usually silent during the initial firing and preparation.²⁵ In essence, the artillery accompanying the exploitation forces was initially in reserve. The very idea of artillery in reserve is hateful to Americans, who never seem to have enough artillery support. Yet, to the Russians, the concept made perfectly good sense. Silent artillery normally did not draw much in the way of counterbattery fire, especially when other units were firing. As a result, few guns were damaged by enemy fire. Silent artillery did not expend ammunition or consume fuel. Accordingly, ammunition racks and fuel tanks remained full. Silent artillery did not exhaust gun crews. Men rested as much as possible. Granted, silent artillery did not inflict any damage on the enemy, but silent artillery assembled in march column accompanied the tanks and infantry into battle with relatively undamaged guns, full ammunition racks, full fuel tanks, and rested gun crews. The resulting close artillery support would have been seriously degraded had the accompanying artillery participated in initial artillery preparation and concentrations.

The Russian concept of artillery support was different from the American concept. For a Russian commander to ask for support was an admission of weakness. If the artillery support were necessary, then

higher headquarters would have sent the required artillery. If the artillery was not sent, the artillery was obviously not needed. Plans were sent down from higher headquarters and the infantry, tank, and artillery commanders were expected to work out any minor details and to exchange information.²⁶

PERIOD THREE

Period Three was the support of the tanks and infantry in the depths of the enemy defenses and began when the mobile groups designated for the exploitation were committed through the breach. The exploitation forces were completely distinct from the assault echelons and were self-contained units which were to apply their combat power at a future time at a given location behind the enemy tactical defenses. The artillery moved in column with the maneuver forces through the breach. The Russian concept was to weight the most successful area and continue the offense. Artillery attacked weapons positions primarily and again concentrated fires along the nose and the flanks of the attacking forces. The artillery's mission was to break up enemy counterattacks and protect the assault force from enemy direct and indirect fire. Period Three began when the assault troops seized the objective and continued until the offensive ended.

KEY RUSSIAN PRINCIPLES

At first glance, Russian principles for providing artillery support for actions at the operational level of war seem no different than the principles at the tactical level of war. How then, can the Russians place so much emphasis upon the operational level of war?

The Russians could do so because they grasped the idea that the real results of a battle came after the tactical penetration, from the actions of the mobile groups during the operational exploitation. The exploitation was the reason for the penetration. Therefore, the Russian process planned for a scheduled changeover from the tactical attack to the operational exploitation a sequence of actions designed to achieve a specific operational goal. How?

PROVIDE ADEQUATE SUPPORT TO COMMITTED UNITS - The Russians were probably the most lavish in their provision of artillery of any army in World War II. The densities of artillery pieces per kilometer of attack sector greatly exceeded what their enemies could field. The overall ratio was not that much greater than 1:1, but the Russians would ruthlessly strip relatively quiet sectors of the front of artillery support to enable them to mass tremendous numbers of artillery pieces in the attack sectors. With 200 guns and mortars combined with 100 tanks and assault guns firing in support of the breakthrough per kilometer of front, there is no way that anyone could even hint that the Russians failed to provide adequate support for each committed unit. They massed large numbers of units.

WEIGHT THE CRITICAL SECTOR - Normally, each assault battalion was supported by an artillery battalion and an antitank artillery battalion, in addition to various tanks, assault guns, mortars, and rocket launchers. Almost all the infantry support tanks (as opposed to the exploitation force tanks) and assault guns were attached to the assault echelons for direct fire support to augment the indirect fire artillery in the penetration sectors. Regimental artillery groups controlled nine or ten artillery battalions in support of the initial

penetrations in the critical sector. The Russians greatly appreciated the concept of weighting the critical sector. However, they also appreciated a relatively sophisticated concept called reinforcing success and not failure (there were exceptions, of course) in order to force the enemy to react to Russian initiatives.

RETAIN MAXIMUM FEASIBLE CENTRALIZED CONTROL - The Russian concept of artillery control is one of centralization. Although they could decentralize control of the regimental artillery during operations, the Russian artillery command and control system was very centralized and the artillery plans and schedules always came down from higher. Those ten battalion regimental artillery groups did not plan their own fires, but received their fire schedules from their superiors. The Russians also used a system of skip echelon communications which allowed the artillery commanders to skip intervening echelons of command to transmit an order to a subordinate. The large groups and centralized control did not allow much tactical flexibility, however.

PROVIDE IMMEDIATELY AVAILABLE ARTILLERY FOR COMMANDER TO INFLUENCE ACTIONS - The Russian artillery was "...divided as follows: on the basis of power of fire and purpose-into light, heavy, high-powered, and special--antitank and anti-aircraft; (and) on the basis of organization-organic (battalion, regimental, divisional), army (corps) and artillery of the general headquarters reserve."²⁶ The commander at each echelon had immediate access to a pool of artillery which was in essence the headquarters artillery reserve, especially at army level, which was the typical operational echelon. Additionally, the skip echelon concept provided a commander with immediate access to any artillery which could hear his voice on the radio or read his message from a courier.

FACILITATE FUTURE OPERATIONS - The Russians were masters at providing artillery for future operations. Their artillery offensive framework forced the artillery to prepare for future operations as period three was the support of the tanks and infantry in the depths of the enemy defenses. In essence, the Russians sequenced their artillery support and movements so that at a given time and place in the future, the appropriate artillery units and support would be in position. The Russians could then set the terms of the battle and continue their offensive. One technique that was especially effective was to accompany the exploitation echelons with fully provisioned artillery which did not take part in the preparation or in the initial assault firing. The artillery marched in the maneuver unit column and many times fired support missions without ever leaving the march formation on the road.

The Russians were effective at supporting their operational level maneuvers and could have provided an example of an effective way to employ artillery to any ally who wanted to observe and analyze their techniques. Analysis of the American experience in World War II shows that the Americans seem to have ignored the experiences of the Russians during World War II.

THE AMERICAN EXPERIENCE

During the early stages of World War II, the American Army was able to observe other armies in combat and learn from the experiences of others. After fighting the Germans in North Africa and Italy, the Americans had ample opportunity to grasp the significance of the operational level of war and then put their experience to work in

Europe. Why they failed to grasp the significance is well beyond the scope of this paper. However, analyzing the employment of the American artillery in support of large tank and mechanized units shows that the Americans still had a lot to learn.

OPERATION COBRA (See Maps III, IV and V)

Following the invasion of Normandy in June 1944, the Americans fought slowly through the hedgerows of the Contentin Peninsula toward St. Lo. By the middle of July, the Americans were ready to break out of the hedgerows. After much study and experimentation, General Bradley chose the American VII Corps to make the breakthrough, using the infantry to "...rupture the line and then mobile elements to exploit and seize objectives in the German rear."²⁷ The initial terrain oriented objectives were only thirty to fifty kilometers behind the enemy front lines, but Cobra eventually became a decisive exploitation.

At 1100B hours on the 25th of July 1944, the American VII Corps penetrated elements of the German Seventh Army following a saturation bombing of the area between Marigny and St. Gilles. VII Corps, consisting of the 1st, 4th, 9th and 30th Infantry Divisions and the 2nd and 3rd Armored Divisions, penetrated the German positions between Marigny and St. Gilles and seized the line from Coutances-Marigny to cut off enemy forces facing the American VIII Corps. The Germans lost many prisoners and much equipment, but worst of all, the western front was ripped open and the German troops did not seem capable of repairing the break.²⁸

In FM 6-20 Field Artillery Manual of Tactics and Techniques 1940, the conduct of artillery support of offensive operations is

divided into three categories. The three categories were the fires prior to the preparation, the artillery preparation, and the fires in support of the attack.²⁹ Significantly, there is no formal mention of operations deep into the enemy rear or actions immediately following the seizure of the objective. The seizure of the objective was the end of the operation. Additionally, the three categories of offensive artillery support were "primarily tactical"³⁰ In the 1944 version of FM 6-20 Field Artillery Tactical Employment, the concept of offensive artillery support no longer was phased or categorized. The Americans obviously did not learn from their experiences during the war or drew the wrong conclusions.

FIRES PRIOR TO THE PREPARATION

Similar to the fire support of the Russian Period One, the American fires prior to the preparation were comprised of "...support of the advance guard actions and of development and deployment, support of preliminary combat to drive in enemy covering forces and to develop the enemy main positions, harassing fire, long-range interdiction, attack of strongly fortified points of enemy reserve positions, gas missions, and counterbattery."³¹

During Operation Cobra, approximately thirty three battalions of field artillery from echelons above corps moved into the VII Corps sector to support the attack and augment the massive bombing scheduled to begin at H-80 minutes. The adjacent corps artillery assets were in position to reinforce the fires in the VII Corps sector. Artillery commanders located their command posts with the supported maneuver unit command posts to facilitate coordination during the operation.

However, the American concept of decentralized fire planning was not as efficient or as well coordinated as the Russian concept. During a typical operation, and Cobra was no exception, division commanders planned their own supporting fires and usually targeted positions to the immediate front of the lines of departure. Additionally, the divisions which were to exploit the initial penetrations were usually directed to have their divisional artillery move forward to positions from which they could support the initial attacks of the assault divisions. The resulting support was not as well coordinated or as continuous as was possible.

PREPARATION FIRES

The VII Corps Operations Order directed the tank destroyer units not actively engaged in antitank action to reinforce field artillery fires during the penetration. Though not nearly like the Russian artillery densities, the VII Corps massed approximately one thousand artillery pieces on a seven kilometer front, reaching a density of nearly one hundred fifty artillery pieces per kilometer.

Like the Russians, the Americans learned that the preparatory fires were more effective if they were relatively short and capitalized on the surprise and initial confusion of the enemy as opposed to attempting the complete destruction of the enemy defenses. During Operation Cobra, the initial preparation was scheduled to last eighty minutes, combining the fires of every available artillery piece. Unlike the Russians, the Americans left no artillery in reserve. The artillery which was to accompany the exploiting divisions reinforced the preparatory fires of the initial assault divisions. Like the Russians, the Americans fired the same types of

concentrations during the preparation; standing barrages, rolling barrages, standing concentrations, and successive concentrations. The types of control were also identical to the Russian methods: scheduled targets, on call targets, or targets of opportunity.³² Also like the Russians, the Americans fired the preparation to neutralize enemy direct and indirect fire weapons positions, command and control facilities, assembly areas, and lines of communication and simultaneously, attempted not to disclose the area of the main attack.³³

Normally the field artillery fired the preparation immediately prior to the assault. The first category of targets was the enemy indirect fire and target acquisition system. The primary purpose of firing the preparation was to gain at least local fire superiority over the enemy to enable friendly maneuver elements to move. Fire superiority over the enemy, obtained either by blinding enemy observation posts or silencing enemy guns, or both, was indispensable to the attack.³⁴

Having gained fire superiority, the artillery concentrated their efforts on neutralizing the enemy defensive positions and reducing obstacles. Americans, like the Russians, realized through experience that prolonged artillery preparations destroyed the element of surprise and gave the enemy time to react. Therefore, typical American preparations were from fifteen minutes to two hours in length, with all available artillery pieces firing.³⁵ Each target in the preparation was fired as a scheduled time on target mission to achieve the maximum surprise and greatest casualty effect.

To increase the effectiveness of the preparation on the enemy front line positions, the direct fire of tanks and direct and indirect

fire of tank destroyers was added to the fire of the artillery.³⁶ Both the Americans and the Russians appreciated the effectiveness of direct fire from high caliber high velocity weapons in silencing or destroying weapons positions.

According to the 1944 version of FM 100-5, the preparation had a twofold purpose. In addition to neutralizing the enemy indirect fire capability and the front line positions, the preparation was to deny the enemy the capability to observe the battlefield and/or move reserves from adjacent or rear units.³⁷ By isolating the chosen battlefield, the attacking commander increased his probability of success and restricted the possible counteraction of the enemy.

During Operation Cobra, VII Corps used twenty one field artillery battalions to augment the preparatory fires and began the preparation at H-80.³⁸ The nondivisional guns fired only a counterbattery and a counterflak program and relatively little artillery fire impacted on other than the enemy front line positions.³⁹ For some unknown reason, almost no targets deep in the enemy positions were attacked. The divisional guns attacked the immediate enemy positions and even the massive airstrikes were within a kilometer or two of the front lines. The Americans obviously had not grasped the necessity of attacking targets throughout the depths of the enemy positions during the preparation, as indicated in the 1944 version of FM 100-5.

FIRES IN SUPPORT OF THE ATTACK

Once the artillery gained fire support superiority, the assault forces moved toward the objective. The importance of fire support superiority at this stage of an operation cannot be overemphasized.

The failure of the initial attack usually equated to the failure of the operation. To prevent the enemy from reacting, the assault troops would attack immediately behind the artillery barrage, even though much training and experience was necessary to prove to the soldiers that advancing too close to a friendly barrage was infinitely preferable to advancing too late or without the barrage.

There were two types of artillery fire during this phase of the operation, protective fire and accompanying fire. Protective fire attacked those points in the attack zone from which the enemy could observe or fire on the assault troops. The intent was to protect the assault troops from counterattacks and long range or flanking fires. Accompanying fire attacked the enemy positions and prevented the enemy from manning those positions in time to meet the assault. Accompanying fire was in direct support of the assault units and was mainly scheduled or on call.⁴⁰

Artillery, tanks, and tank destroyers fired on enemy positions from which the enemy could see or fire on the assault elements. Tanks and tank destroyers provided flat trajectory fires for immediate destruction of strongpoints and dug in weapon positions. Artillery provided indirect fires for counterbattery fire or screening missions. The divisional artillery typically fired a rolling barrage to lead the assault and successive concentrations to neutralize known weapon systems. Nondivisional artillery fired concentrations on enemy artillery and mortar positions, reserve assembly areas, and movement routes into the battle area.⁴¹ Experience showed the effectiveness of using HC smoke shells to screen the assaulting platoons. When the assault units reached the smoke, the artillery shifted the screen deeper into the enemy position.⁴²

Forward observers had great difficulty in deciding where to emplace their observation posts. If they set up where they could view the battle area, they were not with their supported commanders. If they accompanied their commanders, they normally could view only a very small portion of the battle area and many times could not perform their missions.⁴³ A very similar dilemma confronted the artillery unit commander who wanted to be near his unit, yet near his supported commander. The 1944 version of FM 100-5 was very explicit in the placement of the artillery command post. The division artillery command post was normally located with the division command post and at each echelon, the artillery commanders followed suit.⁴⁴ The debate still rages today as to the best placement of the observer and the artillery command post and the artillery community has not resolved the issue, in spite of the fact that the Russians and the American found, through experience, that command post colocation was most effective.

During Operation Cobra, the Corps Artillery Commander controlled the fires and movement of the corps' artillery through the 32nd Field Artillery Brigade. He retained positioning authority for the general support and reinforcing artillery units and divided the responsibilities among the corps artillery staff and the 32nd Brigade's staff. The 32nd Brigade was to control the slower heavy artillery while the corps artillery staff controlled the more rapidly moving artillery which supported the breakthrough and possible subsequent exploitation.⁴⁵

KEY AMERICAN PRINCIPLES

The American principles for providing artillery support at the operational level of war were no different from those at the tactical

level of war because the Americans had not grasped the significance of the operational level of war and were, in essence, a tactically oriented army. The Americans did not make extensive plans for the conduct of actions following the seizure of the tactical objectives and, instead, relied on the initiative and the innovation of subordinate commanders. Most of the doctrinal literature was the "how to" type aimed at echelons up to division. Very few manuals aimed at the less well defined echelons, with maybe the exception of the old FM 100-16 Field Service Regulations Larger Units. As a result, no real guidelines existed for the employment of field artillery in support of actions at the operational level of war.

PROVIDE ADEQUATE SUPPORT TO COMMITTED UNITS - With thirty three battalions moving into the VII Corps sector to augment the fires of the in place units, the Americans obviously provided adequate support to the committed units. Though the densities were not as great as the Russian densities on the Eastern Front, the American artillery support was adequate.

WEIGHT THE CRITICAL SECTOR - The Americans adhered to the principle of weighting the critical sector well. In addition to the artillery firing for the VII Corps, the VIII and XIX Corps positioned their artillery so that their guns could range the projected VII Corps battle area and all three of the proposed exploiting divisions received artillery augmentations. Tank destroyer units that were not actively engaged in fighting enemy tanks added their fires to the artillery in the breakthrough sectors.

RETAIN MAXIMUM FEASIBLE CENTRALIZED CONTROL - The Americans had the best gunnery system and some of the best equipment of the war.

They were able to mass their artillery fires in a manner unequalled by any other force. The 1944 version of FM 100-5 described three types of American artillery: division, corps, and army. Division artillery was primarily a tactical entity for direct support of the division. Corps and Army artilleries were flexible organizations that were to reinforce the fires of the subordinate units and were to be used to conduct counterbattery and interdiction fire.⁴⁶ During Operation Cobra, the division artilleries attacked tactical targets under the command of division commanders while the nondivisional artillery conducted the counterbattery, counterflak, and interdiction programs. Even so, the division artilleries responded immediately when the corps artillery commander directed that the artillery of the entire corps mass its fires on a specific target.

PROVIDE IMMEDIATELY AVAILABLE ARTILLERY FOR COMMANDER TO INFLUENCE ACTIONS - The American artillery had no artillery reserve as did the Russians. However, the non-divisional general support artillery units served practically the same function. The corps artillery commander controlled the slower heavy guns through the 32nd Field Artillery Brigade's headquarters and used the VII Corps Artillery headquarters to control the movements of the rapidly moving units. The corps commander had artillery at his immediate call. The Americans recognized no authorized skip echelon communication system like the Russians. The American communication system was vastly superior to the Russian system, so there may very well have been no need to skip echelons, except in dire emergencies. The American artillery system was so effective that the corps could mass all artillery on a specific target very rapidly and frequently did. During

Operation Cobra, nearly every mission fired at the direction of the corps artillery headquarters was a corps mass time on target mission on particularly important or stubborn targets.

FACILITATE FUTURE OPERATIONS - Although the American artillery espoused the principle of planning for future operations, the typical result was to plan for the immediate mission and once the mission was completed, to rely on the innate initiative and innovation of the artillery commanders to react quickly to the changed situation. They fought the current battle, determined the outcome, and then acted accordingly. Little emphasis was placed on sequencing actions to arrive at a predetermined place and time so that the battle continued following the seizure of the tactical objectives to deny the enemy the opportunity to prepare a coherent defense.

The fault lay primarily with the decentralization of the fire plans. The successful operational artillery support scheme must be planned from the top down and the tactical units should fill in the gaps to achieve specific tactical objectives. The operational support plan cannot simply be a compilation of the subordinate tactical support plans and still be effective.

For example, during Operation Cobra, the artillery of the proposed exploiting divisions was ordered into the front lines to participate in the preparation. When its parent division went into the breach, the artillery was to stop firing and join its division. The result was an acute shortage of ammunition in the artillery units manned by tired personnel at the beginning of the exploitation. Additionally, non divisional artillery units moved forward to the

front lines to range deep into the enemy positions to provide artillery support for the assault divisions while their subordinate division artilleries displaced.

However, no provision was made to provide artillery support beyond the initial range of the guns. The result was that armored artillery units marched in the column with the exploiting tanks and infantry and responded to calls for fire without leaving the road or altering the march formation. Additionally, the artillery air observers permanently stationed themselves above the head of the column to act as both an artillery observer and scout. The observer could talk directly to the artillery and to the column commander and alert both to the disposition of the enemy to the front of the column.

COMPARISONS

The five American principles of tactically organizing and employing artillery assets apply fairly well to the examples in this study. There is, however, in the 1986 version of FM 100-5 Operations, a more appropriate set of considerations for grouping the comparisons in an organized manner. According to FM 100-5, the field artillery is the principal component of fire support at the operational level of war and its "...most important considerations are adequacy, flexibility, and continuity."⁴⁷

ADEQUACY - There is no controversy over the need to support the mission adequately at both the tactical and operational levels of war. At the tactical level of war, adequate artillery support equates to enough rounds on the ground to neutralize the enemy, allowing the friendly units to maneuver and destroy the enemy.

During World War II, the Russians achieved mass on the tactical level by the physically massing artillery units. The Americans relied on a more technological approach and massed fires with a sophisticated gunnery system. In view of the anticipated communication system degradation on the future battlefield, the simpler Russian system would seem more reliable than the American system. However, the Americans currently do not have the requisite number of artillery units which they did in World War II. Therefore, the massing of fires through the gunnery system may be the only viable alternative available to the Americans.

At the operational level of war, adequacy translates into having enough units on the ground to support the operational plan effectively.

effectively. The concept results in the massing of units rather than fires and is caused primarily by the increased scale of the operational area and time.

During World War II, the Russians massed their artillery support by ruthlessly stripping relatively quiet sectors of artillery units and moving them to the main effort area. The Americans, on the other hand, tended to keep their artillery relatively dispersed and again rely on the gunnery system to mass fires rather than units. Here, however, the increased width and depth of the operational battlefield may preclude massing artillery solely by fire.

FLEXIBILITY - The need for flexibility in military operations is paramount at both the tactical and operational level of war. At the tactical level of war, artillery flexibility is the ability to attack a given target under a variety of conditions using any one of various methods.

During World War II, the Russian artillery units were very rigidly standardized in their approach to attacking a target. The resulting artillery norms of today underscore the Russian attempts to standardize the application of artillery support. Since they were so rigid in their relatively few attack methods, they practiced them repeatedly and their proficiency made up for their lack of sophistication. They also developed a method of skip echelon communications, which allowed an artillery commander to immediately change the orders of a subordinate artillery unit without informing the intermediate headquarters.

However, the Russian penchant for strict centralized control prevented much tactical flexibility in the artillery. Instead, the Russian artillery was consistent.

On the other hand, the Americans relied greatly on the flexibility of their units to react to the changing situation and take the best course of action. The target planning system was a case in point. Each unit chose what targets they wanted attacked and then sent their requests up the artillery chain. At each echelon, the lists were consolidated and the duplications were resolved. Unlike the Russians, the Americans placed little emphasis on developing a target list at higher headquarters and sending the list down for the subordinate artillery units to augment as they needed. Both systems have their advantages and disadvantages, but the top-down system seems best.

At the operational level of war, flexible artillery support means having the ability to react to changing situations and maneuvering artillery units or fires to influence the situation. Key to the flexibility of the artillery at the operational level of war is the concept of anticipation. Only through adequate anticipation of future situations, can the artillery commander react effectively.

During World War II, the Russians achieved flexibility through mass. The Americans achieved mass through flexibility. The Russians fielded enough artillery units in the main sector that they could effectively support almost whatever the maneuver units did. They were operationally flexible. They also retained a headquarters artillery reserve with which the operational commander could immediately influence the action. On the other hand, the Americans did not strip all relatively quiet sectors of artillery units. There almost always was some artillery support within range of the action. The Americans relied on their gunnery system to direct the fires of many artillery

units and achieved flexibility through sophistication and technical proficiency. Their flexibility allowed them to mass their artillery.

However, when faced with the rapidly changing situation of an exploitation, both the Russians and the Americans came upon the same solution. The supporting artillery moved in the march column of the exploitation unit and fired missions from positions near to or on the road. Sophisticated gunnery systems provided no real advantage in such a situation, for usually the only unit in range of the target was the artillery in the exploitation column. The Russian technique was better than the American technique, for the Russians kept the artillery for support of the exploitation in reserve until the exploitation units were committed. The Americans kept no artillery in reserve.

CONTINUITY - The need for continuous support is important at both the tactical and operational level of war. At the tactical level of war, continuity of artillery support equates to uninterrupted fires upon the enemy during the engagement or battle in support of the friendly tactical actions. The emphasis is mainly on the disruption and destruction of the enemy in contact.

During World War II, the Russians planned for uninterrupted artillery support from before the action began to after the seizure of the initial objectives. Direct fire self-propelled artillery and assault guns provided the majority of close support for the Russian maneuver forces, while indirect fire artillery provided the majority of the counterbattery and interdiction fire. Artillery units were typically classified by function and range. By assigning units of the correct function and range, the anticipated actions could be supported without interruption.

On the other hand, the Americans again relied on their gunnery system to direct the fires from various units in support of an action so that the maneuver unit was not out of support range of every artillery unit.

At the operational level of war, continuity of artillery support does not mean unbroken or uninterrupted support. Instead, the concept means persistent support without essential change in orientation. All the actions taken by the supporting artillery commander are in concert with the operational plan and are designed to set up anticipated conditions in the future. The emphasis shifts from the disruption and destruction of the enemy forces in contact to the disruption and delay of enemy forces.

During World War II, the Russians emphasized continuity above all else except mass. Their artillery offensive framework insured that artillery planners anticipated situations throughout the operation; from before the assault, through the artillery preparation, through the attack, and through the actions deep in the enemy rear. They assigned artillery units specific missions, such as firing the preparation, supporting the attack, and supporting the exploitation. Artillery units were even held in reserve to better perform their mission when committed.

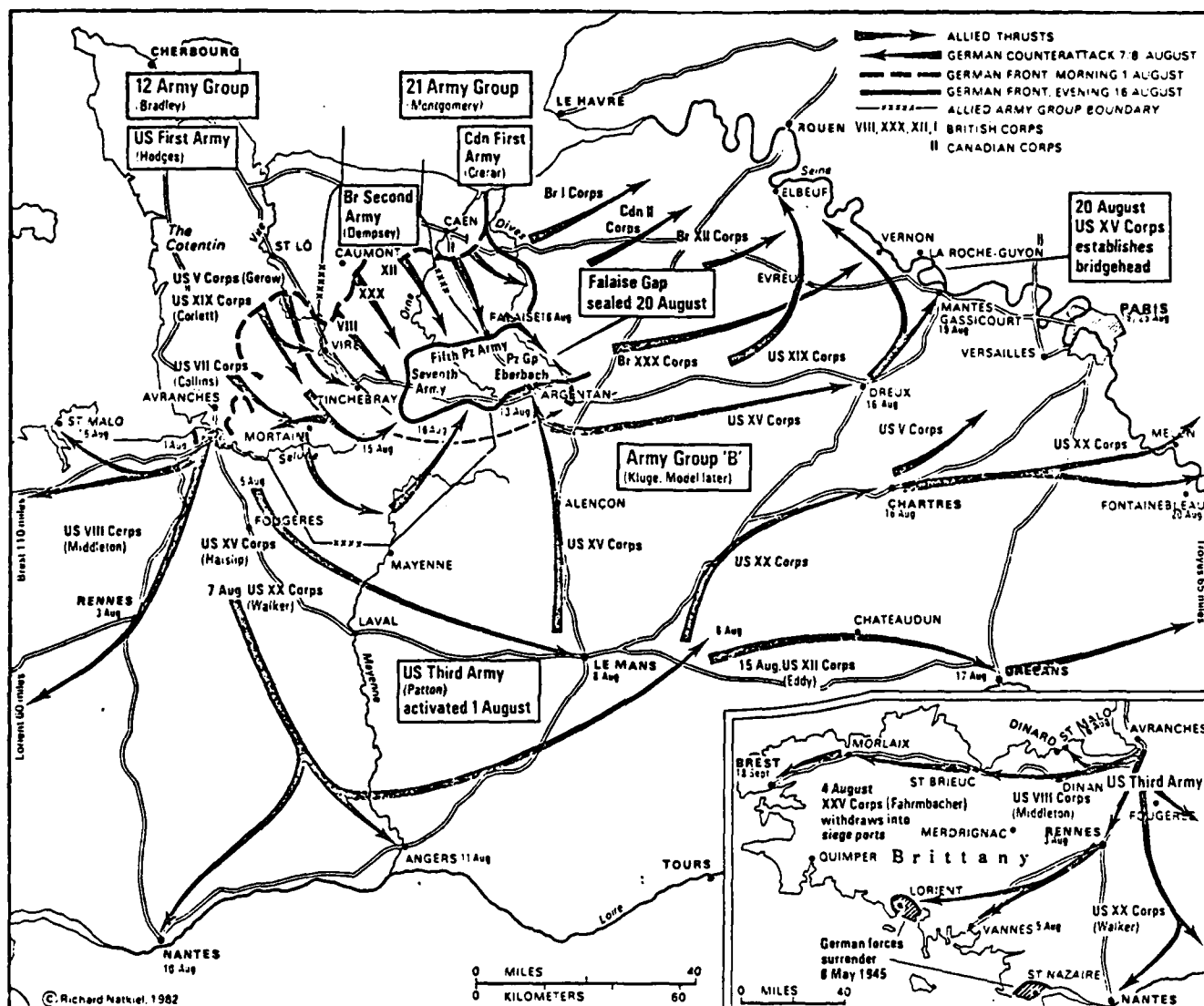
The Americans had no such framework for planning their offensive actions. All plans ended with the seizure of the objectives. The pursuit or exploitation was not an integral part of the overall plan. Artillery units were classified by echelon, not mission. The lower echelons attacked the enemy in contact and each successively higher

artillery echelon attacked targets successively deeper in the enemy defensive positions. As a result, not the greatest effect was always attained, because of a lack of synchronization of activities.

CONCLUSIONS

As long as the current relationship between fire and maneuver remains constant, in that fire supports maneuver, then there are two subtle but important differences between field artillery support of actions at the operational level of war and the tactical level of war. First, at the operational level of war, the artilleryman maneuvers units as opposed to fires at the tactical level of war. Second, at the operational level of war, the artilleryman sequences actions over time in concert with the operational plan to create the desired conditions at the specified time and place in the future as opposed to responding to requests for fire at the tactical level of war.

However, should the relationship between fire and maneuver change, as during World War I when artillery so dominated the battlefield that maneuver supported fire, artillery support at the operational level of war must again be examined.

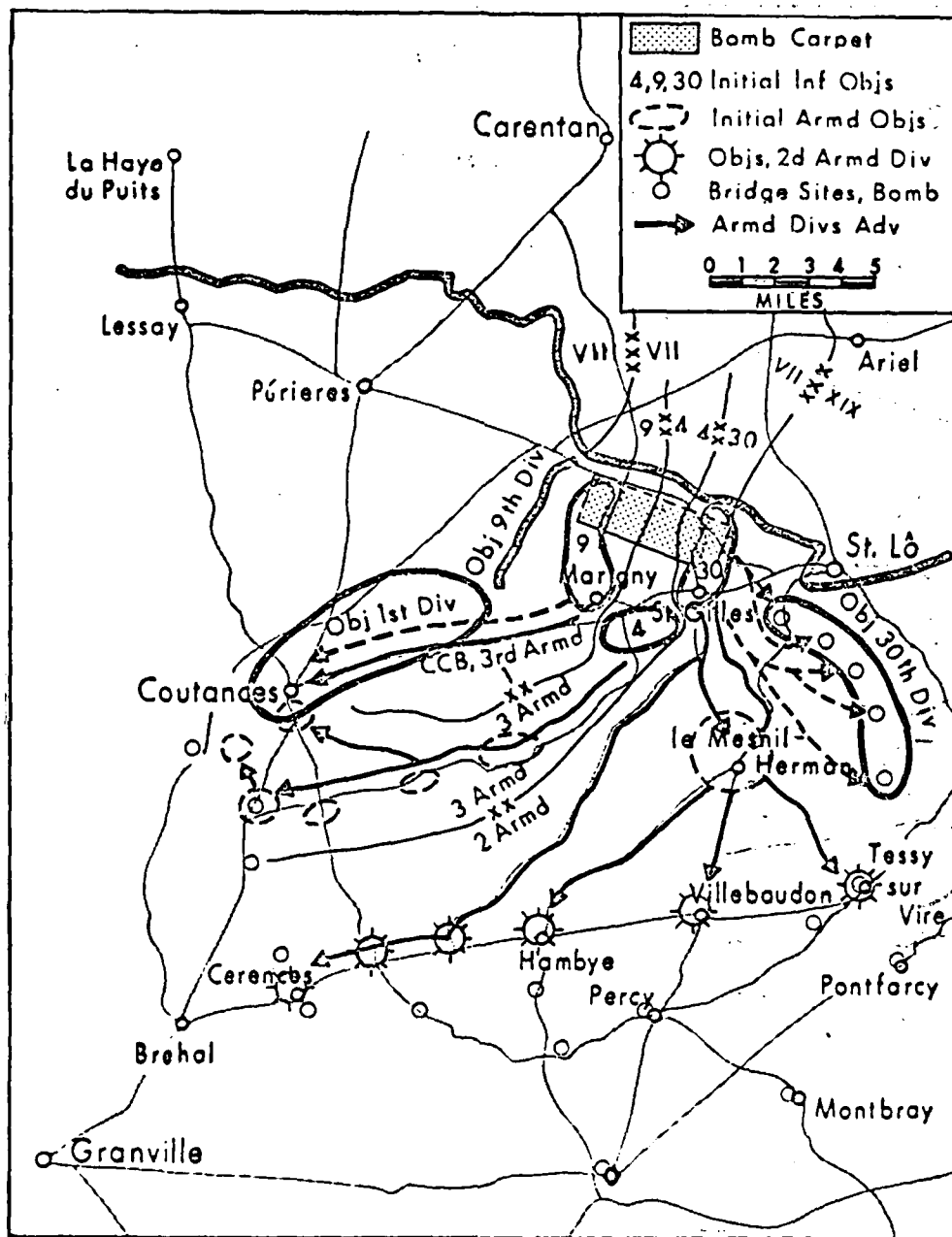


MAP III

OPERATION COBRA

Shown in relation to the other actions during the Normandy Breakout.

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MAP V

OPERATION COBRA

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